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### **Risk and protective factors for persistent depressive symptoms among transgender and non-binary youth: A prospective cohort study**

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**OBJECTIVES/GOALS:** While most transgender and non-binary (TNB) youth experience improved mental health post-initiating gender-affirming hormones (GAH), some continue to experience persistent, significant depressive symptoms two years post-GAH. Importantly, few studies have examined this issue given the lack of existing longitudinal studies. **METHODS/STUDY POPULATION:** We aimed to identify intervenable factors predicting persistent clinical depressive symptoms (PD) among TNB youth two years post-initiation of GAH utilizing the Trans Youth Care U.S. Study, an ongoing, multisite, observational study of TNB youth from four major pediatric hospitals across the U.S. We compared TNB youth (ages 12-20 at baseline) with persisting depression symptoms (PD) two-years post-GAH (i.e., PD; N=59) and those youth without (non-PD; n=215). Logistic regression estimated the association between PD and risk (e.g., negative expectations) and protective factors (e.g., parental acceptance, self-efficacy), measured at baseline and longitudinally. A mixed-effects model compared the rate of change of these factors between PD and non-PD youth. Models controlled for birth sex. **RESULTS/ANTICIPATED RESULTS:** Participants (Mean age=16) identified as transmasculine, then transfeminine, followed by non-binary. PD youth had higher negative expectations at baseline and internalized transphobia by 2-years, while non-PD youth reported greater parental acceptance over 2-years. The odds of PD compared to non-PD decreased with increasing self-efficacy at baseline (OR=0.7, 95% CI:0.5-0.9), whereas negative expectation for the future was associated with increased odds (OR=1.3, 95% CI:0.9,1.8). Moreover, the odds of PD increased 50% with increased rate of change in negative expectations, and odds decreased 50% with increased rate of change in self-efficacy, after adjusting for baseline negative expectations and self-efficacy, respectively. **DISCUSSION/SIGNIFICANCE:** We identified key intervenable factors for mental health treatment for TNB youth with PD; specifically, negative expectations increased risk for PD while self-efficacy appeared to buffer against PD risk. These findings also support assessment of youth for negative expectations for the future conferring greater risk for later PD.

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### **Use of health services and cancer screening among immigrant cancer survivors with second primary cancer**

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**OBJECTIVES/GOALS:** Due to clinical advances, cancer survivors are living longer but have an increased risk of a second primary cancer (SPC). This cross-sectional study aims to examine SPC prevalence in immigrant women and compare healthcare use (HCU) and cancer screening in immigrants with SPC versus (1) immigrants with a single cancer and (2) US-born women with SPC. **METHODS/STUDY POPULATION:** The study population will include adult women with breast/gynecologic primary cancer (PC) from the

2005, 2008, 2010, 2013, and 2015 National Health Interview Survey. First-generation immigrant or US-born status will be defined by region of birth. SPC includes diagnosis with a second cancer type  $\geq 1$  year after the initial PC diagnosis. We will compare the prevalence of  $\geq 1$  SPC in immigrant and US-born women. To evaluate HCU and cancer screening differences, we will assess socio-demographic and socioeconomic factors, risk behaviors, length of US residence, and citizenship status with descriptive statistics. In regression analyses, we will compare number of provider visits and cancer screening rates in immigrant women with SPC versus immigrants with PC alone and US-born women with SPC after matching by age and PC type. **RESULTS/ANTICIPATED RESULTS:** Disparities in cancer diagnosis, quality of care, receipt of recommended treatment, and screening rates among immigrants in the US are well documented. Therefore, we hypothesize that immigrant cancer survivors will have similar or higher rates of SPC compared to women born in the US with variations based on health status. We further hypothesize that immigrants with SPC will report lower rates of HCU after diagnosis of their first cancer and cancer screening compared to US-born women. However, we expect that immigrants with SPC will report similar or higher rates of HCU and cancer screening compared to immigrant women with PC alone. **DISCUSSION/SIGNIFICANCE:** To our knowledge, this study will be the first to describe SPC among immigrant cancer survivors in the US. This research will inform interventions to improve cancer care delivery and ultimately reduce SPC in immigrants with cancer.

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### **Total-body symptom assessment in patients with idiopathic orthostatic intolerance to improve symptomatic management**

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**OBJECTIVES/GOALS:** Total-body symptom surveys among patients with idiopathic orthostatic intolerance (OI) at our referral center suggest that non-conventional OI symptoms, such as pelvic pain, impact quality of life. We seek to identify additional common yet unconventional symptoms reported during clinic visits to improve targeted symptom management. **METHODS/STUDY POPULATION:** Pelvic pain symptom surveys were completed by 178 patients age 18 and over with a chief complaint of OI. Pelvic pain prevalence was assessed using the International Pelvic Pain Society (IPPS) and Pelvic Congestion Syndrome (PCS) surveys. Expanding on this work, surveys will be distributed to a population with the same inclusion criteria but with a broader symptom scope, chosen based on patient reports during clinical encounters—including presence of migraines, cold digits (Raynaud's phenomenon), anxiety and depression. The Migraine Disability Assessment Test (MIDAS), modified Assessment of Systemic Sclerosis-Associated Raynaud's Phenomenon (ASRAP), Generalized Anxiety Disorder-7 (GAD-7), and Patient Health Questionnaire-9 (PHQ-9) surveys, respectively, will be used to obtain symptom prevalence. **RESULTS/ANTICIPATED RESULTS:** Of the pelvic pain survey participants, pelvic pain was endorsed by 144/178 (80.9%) of respondents. Prevalence of the additional surveyed symptoms—migraines, cold digits, anxiety, and depression—will similarly be assessed. Given that in our referral clinic we have observed a trend

of patients reporting these additional symptoms, we anticipate that at least some of them will be prevalent in a majority of the patient population formally surveyed, similar to the trend observed with pelvic pain prevalence. In particular, we anticipate many patients will report significant migraines, as migraine pain severity on a scale of 0-10 with 0 being no migraine pain and 10 being the most severe migraine pain imaginable is one of the elements of the IPSS survey, and 106/178 (59.6%) reported migraine pain of 5 or higher. DISCUSSION/SIGNIFICANCE: Novel treatment approaches for OI are needed, as lifestyle management is the current treatment paradigm. Several patients reporting pelvic pain have undergone targeted workup and subsequent symptomatic treatment that has improved their quality of life. Other targeted symptom approaches to prevalent symptoms could have the same effect.

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### Impacts of Racial Discrimination on Cognitive and Affective Processes and Drug-Cue Reactivity

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OBJECTIVES/GOALS: Our overarching aim is to examine, in an African American population, cognitive, affective, and neurophysiological processes, as well as risk-taking behavior, in response to racial stigma cues. While accounting for individual differences, we aim to see how these processes and drug-cue reactivity are impacted or altered by exposure to racial cues. METHODS/STUDY POPULATION: Participants will be African Americans between 18 and 25 years of age, equally distributed across genders. We will recruit 75 participants in order to have adequate power to conduct our intended analyses—particularly pertaining to individual differences in risk behavior outcomes. Participants will be asked to complete demographic and self-report questionnaires. Participants will also be asked to complete computerized tasks while their physiological responses (heart rate, skin conductance, and electroencephalographic (EEG) data) are recorded. The tasks are as follow: resting, gambling, go/no-go, picture viewing (positive, negative, and neutral images), and a drug cue image set. These tasks will be repeated after the participant views a racial stigma image set to evaluate the impact of discrimination. RESULTS/ANTICIPATED RESULTS: Data from 18 participants has been collected. Data will be periodically preprocessed and validated (e.g., 1 participant was removed due to data recording errors, so the current valid N is 17). Generally, we anticipate that behaviors and neural activity will be modulated across all tasks after viewing the racial stigma image set. Specifically, (a) cognitive and affective processing of singular events of racial stigma may indicate a stress response, (b) modulation from chronic experiences of racial stigma render neural systems increasingly sensitive to stigma cues, and thereby less equipped to regulate stress response, (c) the impact of these processes on altering risk behavior (may increase such behaviors), and (d) the impact of these modulations on altering drug-cue reactivity (may amplify reactivity). DISCUSSION/SIGNIFICANCE: The study will identify factors that contribute to stress and risk behavior among African Americans. A substantial gap continues to exist regarding the nature of risk behavior among African Americans, despite the fact that African Americans represent a health disparity population with unique vulnerabilities to health-relevant risk behavior.

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### Changes in the Incidence of Respiratory AIDS-Defining Events Among Persons with HIV Before vs. During the COVID-19 Pandemic

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OBJECTIVES/GOALS: The COVID-19 pandemic disrupted HIV care, though it prompted preventive measures for respiratory pathogens, particularly among PWH. We therefore quantified trends in respiratory ADE incidence during vs. before the COVID-19 pandemic to assess effects of these measures on non-COVID-19 illnesses. METHODS/STUDY POPULATION: We included PWH aged  $\geq 18$  years in care at the Vanderbilt Comprehensive Care Clinic in Nashville, Tennessee from 2017-2023. Individuals contributed time from the last of March 31, 2017 or clinic enrollment until the first of death, March 31, 2023 (study close), or final clinic visit (if there was no visit  $\leq 12$  months before study close). We described respiratory ADE incidences (per 1,000 person-years) in each year of the study; we used Poisson regression with robust variance to estimate the incidence rate ratio (IRR) and 95% confidence interval (CI) for respiratory ADEs in the three years following vs. before the World Health Organization's pandemic designation for COVID-19 (March 2020). RESULTS/ANTICIPATED RESULTS: Among 4,880 persons contributing 19,510 person-years, 69 (1.4%) developed  $\geq 1$  respiratory ADE. Median age at cohort entry was 42.6 (interquartile range [IQR]: 32.1, 52.3) years and at first respiratory ADE was 43.6 (IQR: 36.1, 51.2) years. The overall average respiratory ADE incidence in the pre-pandemic period (March 2017-March 2020) was 4.5 (95% CI: 3.3-6.3) per 1,000 person-years and during the post-pandemic period (April 2020-March 2023) was 4.1 (95% CI: 1.8-9.0) per 1,000 person-years. When accounting for repeated outcomes and annual variation, the modeled respiratory ADE incidence was 10% lower (IRR=0.9, 95% CI: 0.6-1.4) during vs. before the COVID-19 pandemic. DISCUSSION/SIGNIFICANCE: Respiratory ADE incidence dropped 10% following the COVID-19 pandemic declaration, though the confidence interval for this change contains the null. It is plausible that nonpharmaceutical COVID-19 mitigation measures drove a brief but impermanent decline, though further research is needed to assess whether diagnostic biases also played a role.

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### Trends in Management of Chronic Kidney Disease among Adults with Diabetes, NHANES 1988-2020

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OBJECTIVES/GOALS: Chronic kidney disease (CKD) affects nearly 40% of adults with diabetes. Our objective is to assess trends in risk factor control and use of 2022 ADA and KDIGO guideline-recommended medications. METHODS/STUDY POPULATION: Using